

### CLAIMS

1. A device to eliminate trimmings or scraps from series of products comprising: at least a continuous movable flexible member (23) carrying a series of contact members (29, 29A, 29B) for the products (R; R1; RN) aligned with one another, a section of said movable flexible member being devoid of said contact members to allow trimmings (Rc, Rt) to fall; at least a longitudinal supporting element (21) of the products (R; R1, RN), parallel to said movable flexible member, the reciprocal position of said flexible member and of said longitudinal element being such that the products advance in contact with the contact members (29, 29A, 29B) of the flexible member and with the longitudinal element; at least a pusher (11) to insert the series of products with respective trimmings between said flexible member and said longitudinal supporting element; characterized in that said flexible member (23) is controlled with a variable speed to carry the section thereof devoid of contact members every time to the level of the tail and head trimmings (Rc; Rt) of two consecutive series of products.

2. Device as claimed in claim 1, characterized in that said longitudinal supporting element (21) is fixed.

3. Device as claimed in claim 1 or 2, characterized in that said continuous flexible member (23) has at least a first contact member (29B) designed to grasp at least the last product (RN) of each series and make it advance.

4. Device as claimed in claim 1, 2 or 3, characterized in that said continuous flexible member (23) has at least a second contact member (29A) designed to grasp at least the first product (R1) of each series and make it advance.

5. Device as claimed in one or more of the previous claims, characterized in that at least some of the contact members (29) are provided with a contact surface for the products having a low friction coefficient, to allow said products to slide with respect to said supporting members.

6. Device as claimed in one or more of the previous claims, characterized in that said flexible member (23) is controlled at a variable speed to accelerate at least the last product (RN) of each series with respect to the pusher therebehind (11).

7. Device as claimed in one or more of the previous claims, characterized in that said flexible member (23) is controlled at a variable speed to accelerate and, if necessary, subsequently decelerate at least the first product (R1) of each series with respect to the subsequent product.

5 8. Device as claimed in one or more of the previous claims, characterized in that said flexible member (23) is controlled to advance at a lower speed or to stop during an interval of time between arrival of the first product (R1) and arrival of the last product (RN) of each series, during said interval of time the products being pushed by said pusher (11) and sliding  
10 along the flexible member (23) resting on the contact members (29).

9. Device as claimed in at least claims 3 and 4, characterized in that one or more contact members (29A, 29B) disposed at each end of the series of contact members carried by said flexible member (23), adjacent to said portion of the flexible member devoid of contact members, can be  
15 operated to have an grasping effect on the products in contact therewith.

10. Device as claimed in one or more claims 3, 4 or 8, characterized in that said contact member or members designed to grasp said products are mounted movable, with respect to the flexible member (23) which carries them, at least in a direction essentially orthogonal to said flexible member.

20 11. Device as claimed in one or more of claims 3, 4, 9 and 10, characterized in that the contact members (29A, 29B) designed to grasp the products have a movable portion (31, 33, 33T; 29X).

12. Device as claimed in claim 11, characterized in that a fixed control profile (37) acts on said movable portions, an elastic element (35)  
25 being provided to hold each said movable portion in contact with said fixed control profile.

13. Device as claimed in one or more of the previous claims, characterized in that said flexible member (23) and said longitudinal supporting element (21) are arranged one above the other.

30 14. Device as claimed in claim 13, characterized in that said flexible member (23) and said longitudinal supporting element (21) are approximately vertically overlapped with each other.

15. Device as claimed in claim 13, characterized in that said flexible member (23) is laterally staggered with respect to said longitudinal supporting

element (21).

16. Device as claimed in any one of claims 13 to 15, characterized in that said longitudinal supporting element is positioned under said flexible member.

5 17. Device as claimed in one or more of the previous claims, characterized in that said flexible member (23) is controlled to be accelerated synchronously with the position of said pusher, to distance the last product (RN) of each series from the pusher therebehind.

10 18. Device as claimed in one or more of the previous claims, characterized in that said flexible member (23) is controlled to be accelerated synchronously with the position of said pusher, to distance the first product of each series at least temporarily from the subsequent product.

15 19. Device as claimed in one or more of the previous claims, characterized in that said flexible member (23) includes a pair of parallel chains, one of said chains being provided with a plurality of intermediate contact members (29), said intermediate contact members being arranged in a laterally staggered position with respect to said longitudinal supporting element (21).

20 20. Device as claimed in claims 3 and 19, characterized in that said first contact member (29B) designed to grasp at least the last product (RN) of each series of products includes two shoes (29X) and that means are provided to control a grasping motion of said shoes.

25 21. Device as claimed in claims 4 and 19 or 4 and 20, characterized in that said second contact member (29A) designed to grasp at least the first product (R1) of each series of products includes two shoes (29X) and that means are provided to control a grasping motion of said shoes.

30 22. Device as claimed in claim 20 or 21, characterized in that the two shoes (29X) of said first and second contact members (29A, 29B) are controlled by a fixed cam profile, which controls a closing motion of said shoes.

23. Device according to one or more of claims 20, 21 or 22, characterized in that each shoe (29X) of said first or second contact member (29B, 29A) is carried by a respective one of said chains.

24. Device as claimed in claim 3 or 4, characterized in that at least

one of said first and second contact members (29A, 29B) designed to grasp said products include jaws or pliers shaped grasping members.

25. Device as claimed in one or more of the previous claims, characterized in that said at least one pusher has a slot (11A) in which the  
5 longitudinal supporting element (21) penetrates when said pusher pushes the products between the longitudinal supporting element and the flexible member.

26. Device as claimed in one or more of the previous claims, characterized in that said products are rolls obtained from cutting a log.

10 27. Method to eliminate head and tail trimmings (Rt, Rc) from a series of aligned products (R, R1, RN), wherein a series of products is pushed by a pusher (11) between a longitudinal supporting element (21) and a continuous movable flexible member (23) equipped with contact members (29, 29A, 29B), said contact members being in contact with the products  
15 which advance between said flexible member and said longitudinal supporting element, said flexible member having a section devoid of contact members at the level of the head and tail trimmings (Rt, Rc) of said series of products to cause said trimmings to fall, characterized in that said flexible member (23) is controlled at a variable speed to carry the section thereof devoid of contact  
20 members every time to the level of the head and tail trimmings (Rc; Rt) of two consecutive series of products.

28. Method as claimed in claim 27, characterized in that said longitudinal supporting element is held fixed.

29. Method as claimed in claim 27 or 28, characterized in that said  
25 products are made to advance parallel to said supporting element and at least the last product of each series is grasped by means of said contact members to make said product advance along said supporting element by means of said flexible member (23) when said pusher (11) loses contact with the series of products.

30 30. Method as claimed in claim 29, characterized in that the speed of said flexible member is varied to accelerate at least the last product of each series to distance said product from said pusher.

31. Method as claimed in one or more of claims 28 to 30, characterized in that the speed of said flexible member is varied to accelerate

the first product (R1) of each series to distance said product from the subsequent product.

32. Method as claimed in claim 31, characterized in that the first product of each series is subsequently decelerated, said acceleration and subsequent deceleration guaranteeing that the head trimming (Rt) of each series of products falls.

33. Method as claimed in one or more of claims 27 to 32, characterized in that said contact members are temporarily stopped or made to advance at least temporarily at a lower speed to the advance speed of the products determined by the speed with which they are pushed by the respective pusher, the products sliding with respect to said contact members while resting thereon.

34. Method as claimed in one or more of claims 27 to 33, characterized in that said longitudinal supporting element is disposed under said flexible member.

35. Method as claimed in one or more of claims 27 to 34, characterized in that said flexible member and said longitudinal supporting element are essentially vertically overlapped with each other.

36. Method as claimed in one or more of claims 27 to 35, characterized in that one or more of said contact members are pressed at least temporarily against the last product of each series, to grasp said product.

37. Method as claimed in one or more of claims 27 to 36, characterized in that one or more of said contact members are pressed at least temporarily against the first product of each series, to grasp said product.

38. Method as claimed in one or more of claims 27 to 35, characterized in that at least one of said contact members laterally grasp the first or the last product of each series of products.

39. Method as claimed in one or more of claims 27 to 38, characterized in that said pusher is made to advance between said flexible member and said longitudinal supporting element.

40. Method as claimed in claim 39, characterized in that said longitudinal supporting element is made to penetrate a slot produced in said

pusher to allow advance of the pusher and inversion of the trajectory thereof.

41. Method as claimed in one or more of claims 27 to 40, characterized in that said products are rolls obtained by cutting a log.

42. A cutting machine to cut logs of web material wound in rolls,  
5 characterized in that it comprises a device to eliminate the trimmings as claimed in one or more of claims 1 to 26.